

ABSTRACT OF THE DISCLOSURE

The new scintillators are connected at one or more points or on one or more sides or faces, or on any or all sides to conductors which are collimators, lenses or fiber ends. Optical fibers in cables conduct the photons generated by the crystal scintillators to photon-actuated devices. The devices may be mounted near the crystal scintillators or remote from the crystal scintillators, for example on surfaces near drilled wells or exploration holes. The crystals or scintillators have any of several cross-sections. Down hole detectors or detectors used in other adverse conditions are ruggedized, with rugged flexible outer cases which are transparent to the looked-for energy, particles or rays, gamma rays for example. Inner scintillator construction of multiple aligned or angularly related scintillators connected to optical fiber ends allow bending, twisting and flexing without damaging scintillator arrays, individual scintillators, lenses or fiber optic connections. Optical fibers are connected to optical couplers on gamma camera plate scintillators to transmit patterns of photons through optical fiber cables to remote reading, storing or detecting sites. Illumination of remote sites is provided by fibers that parallel the photon conducting fibers. One or more optical fibers illuminates the site being studied by the scintillator, and one or more optical fibers return images of the site to a viewer screen or recorder.